



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,144	03/29/2004	Hee-joong Lee	Q74907	1114

23373 7590 06/14/2005

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

BLACKMAN, ROCHELLE ANN J

ART UNIT PAPER NUMBER

2851

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,144

Applicant(s)

LEE ET AL.

Examiner

Rochelle Blackman

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12 and 14-17 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/26/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 4 and 5 are objected to because of the following informalities: on line 3 of the claims, "optical separator" should be - -color separator- -.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7, 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lambert (U.S. Patent No. 6,288,815) in view of Davis (U.S. Patent No. 6,813,087).

Regarding claim 1, Lambert discloses a projection system (see FIGS. 1-9) comprising: a light source (see 16 and *WHITE LIGHT* in FIG. 3); a color separator (see *DICHROIC CUBE* in FIG. 3) which separates an incident beam according to color; a scrolling unit (see 20 of FIG. 3, 30 of FIG. 7A, 32 of FIG. 7B, and 40 of FIG. 7C), comprising at least one lens cell (see 24, 25 of FIG. 3; 31 of FIG. 7A; 33 of FIG. 7B; 41 of FIG. 7C; and 42, 43 of FIG. 7D), which converts a rotation of the lens cell into the rectilinear motion of an area of the lens cell

Art Unit: 2851

through which light passes so that an incident beam is scrolled, a light valve (see 17 of FIG. 3 and *single light valve* in col. 4, lines 15-17, output 17 is considered to be directed to a light valve of some sort) which processes a beam transmitted by the color separator and the scrolling unit according to an image signal and which forms a color picture, and a projection lens unit (although, not shown, the "projection system" is considered to have a projection lens of some sort to project the image from the light valve onto the screen) which magnifies the color picture formed by the light valve and which projects the magnified color picture onto a screen.

Regarding claim 12, Lambert discloses wherein the scrolling unit comprises a spiral lens disk (see 33 of FIG. 7B) see on which at least one cylindrical lens cell is spirally arranged.

Regarding claim 15, Lambert discloses first and second cylindrical lenses (see 22 and 23 of FIG. 3) respectively disposed in front of and behind the scrolling unit.

Regarding claims 1-3, 7, and 14, Lambert does not appear the light valve comprising a "plurality of micromirrors independently driven according to image signals to change a reflection angle of incident light; a total internal reflection prism disposed in front of the light valve, which directs light passed through the color separator and the scrolling unit toward the light valve and which directs light reflected by the light valve toward the projection lens unit; wherein the total internal reflection prism comprises: a first prism, having an incidence surface, a second prism, attached to the first prism at an interface and having an emission

Art Unit: 2851

surface, and a total reflection surface, formed on the interface between the first and second prisms, for totally reflecting incident light at a predetermined angle; and wherein the micromirrors are perpendicularly driven according to the image signals; and a spatial filter disposed between the light source and the scrolling unit, which controls a divergence angle of the light emitted from the light source”.

Davis teaches providing the light valve comprising a plurality of micromirrors independently driven according to image signals to change a reflection angle of incident light (see 120 of FIG. 1); a total internal reflection prism (see 122 of FIG. 1) disposed in front of the light valve, which directs light passed through the color separator and the scrolling unit toward the light valve and which directs light reflected by the light valve toward the projection lens unit; wherein the total internal reflection prism comprises: a first prism (see left-hand prism of prism 122), having an incidence surface, a second prism (see right-hand prism of 122), attached to the first prism at an interface and having an emission surface, and a total reflection surface (see surface in middle of 122 formed by the two prisms), formed on the interface between the first and second prisms, for totally reflecting incident light at a predetermined angle; wherein the micromirrors are perpendicularly driven according to the image signals (see 120 of FIG. 1); a spatial filter (see 108 of FIG. 1) disposed between the light source and the scrolling unit, which controls a divergence angle of the light emitted from the light source.

It would have been obvious to one ordinary skill in the art at the time the invention was made to provide the “projection system” of the Lambert reference

Art Unit: 2851

with a light valve comprising a plurality of micromirrors, a total reflection prism, and a spatial filter, as taught by Davis in order to provide a projection system with a higher illumination efficiency at a low cost that can improve the compromise between increase brightness and color saturation (see col. 1, lines 61-63).

2. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lambert (U.S. Patent No. 6,288,815) in view of Davis (U.S. Patent No. 6,813,087) as applied to claim 1 above, and further in view of Ouchi et al. (U.S. Patent Application Publication No. 2003/0169376).

Lambert and Davis disclose the claimed invention except for “wherein the color separator comprises first, second, and third dichroic filters, which are disposed in parallel between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors; and further comprising a prism disposed in front of the color separator”

Ouchi teaches providing a color separator comprises first, second, and third dichroic filters (see 5a, 5b, and 5c of FIG. 11), which are disposed at different angles between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors; a color separator comprises first, second, and third dichroic prisms (see 5 of FIG. 9) sequentially attached to one another between the light source and the scrolling unit, wherein the first, second, and third dichroic prisms respectively include first, second, and third dichroic filters (see pg. 7, paragraph [0055], lines 7-12), each of which reflects a beam of a color and transmits beams of all other colors; a color separator comprises first, second, and third dichroic filters (see 5 of FIG. 9),

Art Unit: 2851

which are disposed in parallel between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors (see pg. 7, paragraph [0055], lines 7-12); and further comprising a prism (see first prism on right-hand side of 5 in FIG. 9) disposed in front of the color separator.

It would have been obvious to one ordinary skill in the art at the time the invention was made to provide the "projection system" of the combined Lambert and Davis reference with a color separator with salient features of Ouchi, in order to increase the utilization ratio of light and improve screen brightness, prevent increase in cost of the optical system and apparatus and to eliminate the need for adjustment of R, g, and B light projection spots (see pg. 1, paragraph [0004]).

3. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lambert (U.S. Patent No. 6,288,815) in view of Davis (U.S. Patent No. 6,813,087) as applied to claim 1 above, and further in view of Bierhuizen et al. (U.S. Patent No. 6,839,095).

Lambert and Davis disclose the claimed invention except for "first and second fly-eye lens arrays sequentially disposed on a light path between the scrolling unit and the light valve; and a relay lens disposed on a light path between the second fly-eye lens array and the light valve".

Bierhuizen discloses first and second fly-eye lens arrays (see 120 and 122 of FIGURE 7) sequentially disposed on a light path between the scrolling unit and the light valve; and a relay lens (see 128 of FIGURE 7) disposed on a light path between the second fly-eye lens array and the light valve.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the "projection system" of the combined Lambert and Davis reference with first and second fly-eye lens arrays and a relay lens, as taught by Bierhuzen in order to increase light transmission efficiency and focus light toward the light valve.

Allowable Subject Matter

1. Claims 4-6, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. The following is a statement of reasons for the indication of allowable subject matter:

Claim 4 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the projection system comprising a reflection mirror with features and functions recited in claim 4, in combination with the particular combination of features recited in claims 1-3.

Claim 5 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the projector comprising a reflection prism with the features and functions recited in claim 5, in combination with the particular combination of features recited in claims 1-3.

Claim 6 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the projection system comprising micromirrors that are diagonally driven according image

Art Unit: 2851

signals, in combination with the particular combination of features recited in claim

1.

Claim 13 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the scrolling unit comprising a glass rod disposed between the first and second spiral lens disks, in combination with the particular combination of features recited in claim

1.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ishihara et al. (U.S. Patent No. 6,535,256), color liquid crystal display.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rochelle Blackman whose telephone number is (571) 272-2113. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2851

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RB

A handwritten signature in black ink, appearing to read "Judy Nguyen", is positioned above the printed name.

JUDY NGUYEN
SUPERVISORY PATENT EXAMINER